

Note-book 4 New Jersey Division - Archean Division

Sept. 30, 1891

Field notes of Aug. T. Foerste Fall 1891.

to accompany map.

to accompany map with localities.  
Examination of Cambrian along W. border of Archean Highlands  
from Hamburg to S. of Andover N.J.

U. S. GEOLOGICAL SURVEY

9-896



Aug. J. Foerste

Field notes on the Cambrian  
sandstones & limestones of the  
Western border of the New Jersey  
Highlands and within the  
Archean mass.

(See accompanying portion of 'Central  
Highlands & Plate' table sheets  
nos 30, 31, 32 on which the numbers  
of observations are marked.

Sept. October November 1891.

Note. Book No. 4.

Discoveries of fossils pp. 5, 7, 9, 15, 17, 29, 31, 37  
43, 55, 103, 115, 139, 171 (2).

Summary by A. T. Foerste pp. 1-4.



The Archaean is a complex of  
sedimentaries and igneous  
much folded and sheared, the  
combined result giving a gen-  
eral N.E. strike and S.E. dip  
of the shearing planes, often  
mistaken for stratification.

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This complex contains a  
thick bed of limestone, whether  
one or more levels is un-  
known. This limestone is  
commonly also a hornblen-  
dite, more or less pyroxenitic,  
garnetiferous, magnetitic, etc.,  
as the result of paragneissification.

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The limestone is probably  
not at the top of the Archaean  
series, but forms a large bed  
in the same, and has en-  
folded all the foldings of the  
other Archaean strata.

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At certain localities the Archaean strata stratigraphically above the Archaean limestone have been removed during the period of base level erosion antecedent to Cambrian times; from the Archaean limestones to such an extent that the latter appeared exposed over large areas. One of these areas, the largest was that about Franklin Furnace.

Another lay south of Sparta Junction. A third lay east of a line running almost N + S through Andover. A fourth lay along the Bladen River hill, south of Andover.

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On the base levelled Archaean was deposited everywhere in the area under consideration the Cambrian sandstone, usually fossiliferous.



Next, the Mayanorian limestone  
of Rogers, Cook &c.

Then the Trenton limestone.  
Then the Hudson River slate &c.  
These are always present in all  
undisturbed sections.

After the general folding  
which involved all paleozoic  
strata took place, it never  
till now been possible to  
readily make out the succession  
of deep cuts existed, since the  
folding was remarkably simple.

After the folding a series of faults  
took place in the so-called White  
limestone area, of the Vernon  
Valley, from Franklin Furnace  
northward &c, &c. The failure  
to recognize these faults,  
was the chief cause for much  
of the faulty stratigraphical  
work done here.



At certain localities the Ar-  
chaeon is + is a ~~stratigraphic~~ match.

The failure to distinguish be-  
tween the Archæan limestones,  
usually very coarse grained, but  
showing variations in grain—  
and the Cambrian limestone,  
often brecciated at the fault line  
and then moderately metamorphosed  
—has been another stumbling block.

One failure to recognize the Ar-  
chæan gneisses as something  
distinct from Archæan true  
granites, and calling everything  
granite has been another mis-  
take. This mistake was not so  
much petrographic, as structural  
and since the "granite" was falsely  
supposed to have metamorphosed  
the Archæan limestones, under  
the supposition that this lime-  
stone was Cambrian. This made  
the granite to post Cambrian.  
This is wrong. It is pre Cambrian.



Plane-table sheet-32

1 North of Fairport, Ontario, West of Long  
Point. More or less continuous  
to the East and from the point  
at the point: — *Scotthia linearis*,  
*Aletris Thompsoni*.  
Strike Magnetic N 48 E dip 55 N.



Sheet-32

- 2 North west of Franklin Furnace,  
South west of South west Mine.  
Unconformable contact of Achenbach  
and Cambrian sandstone.  
Strike Magnet 2, N 48 E dip 55 W.  
Fossils *Orthis* *Thompsoni*  
*Hypothyris americana?*  
*Spirifer*



Sheet 32.

3. Almost W of Franklin & across  
dip. On east side of hill at  
its southern extremity, but before  
the contact of the main with the Cambrian.  
Strike Magnetic N 55 E dip 65 W.  
Fossil Abundant Thompson.



Sheet 32.

- 4 At Cross Roads, West of Franklin  
Farmace. Dike and dip much  
as before. There is the same un-  
conformity between the Archæon  
and the Cambrian strata here,  
but the fossiliferous Cambrian  
sandstones have been eroded out,  
and are now covered up. The de-  
pression here locates the same  
however.



Sheet 32.

5 West of Franklin Farmstead, Only  
the Ash Grove is shown here. None of  
the Cambrian strata are exposed.

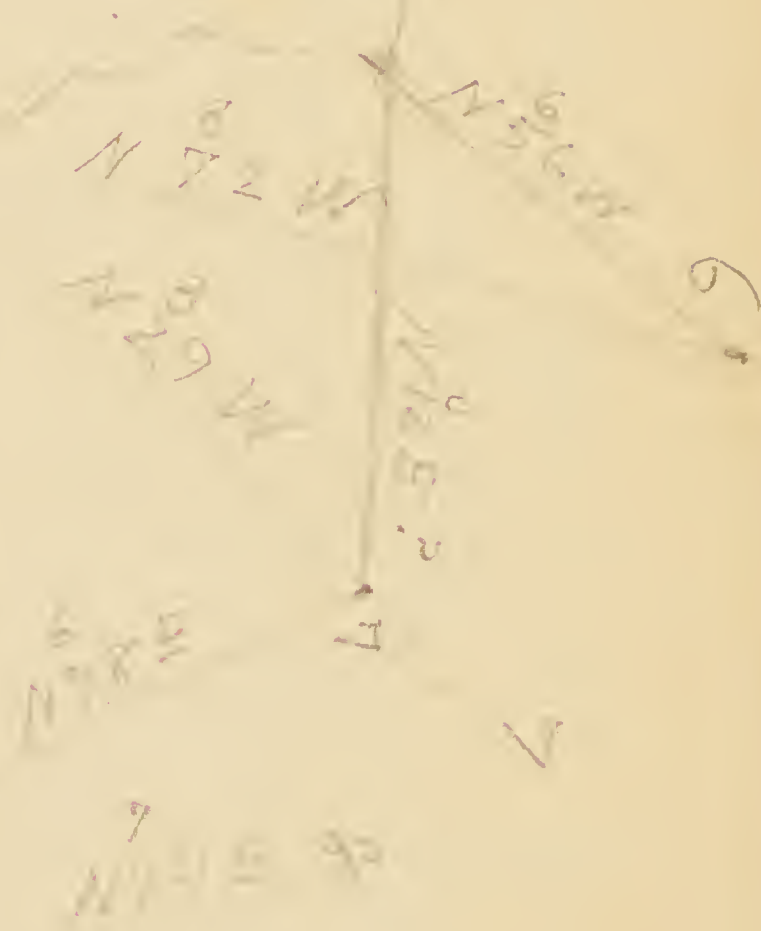


Sheet 32

6 Between Manor's Cairns and  
Ardaraugh, North, on line.  
Uniformity between Ordovician  
and Cambrian formations. The  
exposure is in and around a  
small clump of trees between  
the long line of woods covering  
the hill and a small line of  
trees further west, where there is quite  
a steep descent into the valley.  
Strike Magnetic N52E, dip 60-70 W.  
Fossils, *Chonetes Thompsoni*  
*Spirifer linearis*  
*Hypothyrida* *Conularia* *Orthis*



Rail Corral





Sheet 32.

- 7 About north east of creek where  
where three roads meet,  
the junction between Archean  
and Cambrian sandstone. Along  
a steep ridge covered on the east  
side with low bushes, between the  
woods proper on the left, and a  
wooded declivity on the west.  
The ridge with N 58 E dip steeply  
to the S. In a fragmentary place of  
lime stone. The composition  
is also the same.

North west of the locality is good strike  
Magnetic N 56 E, dip 50 W.



Sheet 22.31

8 About east of the colored house  
where there is a road, east of  
Lamb's Pond.

Unconformity between Archæan  
and Cambrian. The contact  
however not shown. A stream in the  
east well exposed. The stream  
occupied the place of the covered for  
colleagues Cambrian sandstone.  
The shales are mostly clay. The  
concretionary nature of the sand-  
stone is shown however.  
At the bridge N60 E dip 40 W.  
No fossils.



Sheet 27.31

- 9 Perhaps this exposure of the Archæan  
belongs a little further up hill.  
South of exposure is a small house  
No. 10000.



10 The exposures from 9 to 10 are all of Archean rocks. No Cambrian is shown but the exposures of Archean are so much in line and they seem so well to carry on the strike relation by the contacts farther north, that the exposures present so much the same configuration that makes for the evidence of the Archean for the point can be readily established. It is well to admit that this line of lineation could represent anything else than the line of contact between the Archean and the Cambrian is undisturbed.



• 1862.



Sheet 32

12 Archdeacon exposure with base  
of the Scapular Hill No. 1000 -  
brown to blackish gray representing  
the base.



Sheet 32

- 13 *Sinuatum* exposure, No. 1000 -  
has an exposure on Buckhorn, N.W.  
of Springfield, Ill.  
Dip 100°, N50E dip 45W  
A little further up the N. 100°  
line the *Onchocoma* is exposed  
again - here a plenty of fossils  
- *Onchocoma* - *Onchocoma* -  
in the form of boulders of small  
size in the depression above the  
formation - *Onchocoma* -  
with *Onchocoma* - *Onchocoma* -  
to the *Onchocoma*.



Sheet 32

14 West of Du Wards, north of Sea-  
ford, Minn.  
Archaeological Excavation  
excavated in 1901  
Fossils found in Thompson  
scattered in soil  
Strike Magnetic N 50 E dip 50 W.



Stat 32.

15 South west of a stone, 200 yds  
end of Zerk's Island. Chamberlain  
bottomed here 12 fathoms 180 ft. the  
dry and stone as heretofore.  
No bottom seen.



Sheet 32.

16 North coast of Linnæa Stone.  
Crabapple, Lythrum, and Limestone  
Recluse in water. No Limestone











Sheet-32:

18. Another view by water from the same  
spot between the bridge & the road,  
showing the same rocks. The  
Cannon is very clearly visible in view  
by looking up the river, east of the  
bridge. The water is very shallow  
here, & the rocks are exposed  
by the rapid current. The  
water is very shallow.











21 Exposure of Breconian Limestone  
in a low profile with a few  
fossils visible

Sheet 32.



Sheet 52.

22 Hill 320 is a camp on a ridge of  
Arch. low limestone. On the  
west slope of the hill there seems  
to be a little much weathered  
granite looking like a mass of  
white limestone. But it is a  
rock which is the same as the  
the present rock. In the south  
On the south side of the hill there  
is a large white granite in many places of  
large white granite. In some places  
it is a little more weathered  
than the rest of the hill. It is a  
large white granite.

Compare Naam Geol. Soc. N. J. 1890 p. 44  
Makes double out. S. S. with wh. d. between &  
overlying on summit. Makes S. end of hill  
composed of quartzite in place (supposed to be)



Sheet 82 2.

23. At the bridge south of the Glenora Mine, south of Andover.

One Cambrian sandstone rugose here to lie on the east side of the little knoll along the road just S. E. of the bridge, near the little stream. However neither Archæan nor Cambrian is shown here. I did not try to find Cambrian farther south since I thought this station 23 was far enough to prove the Archæan nature of the crystalline limestone at the Glenora Mine.



Sheet 2.

4. At the chestnut tree by the roadside, west side of the fence, is the S. Indian Mine.

There is above the limestone, which runs into a sandstone in the west, the sandstone representing the Cambrian. No fossils were found. The Archæon is 30 paces toward the N.E. A valley conceals the contact.

Strike Magnesian N 30 E Dip 65 W.

This strike continues northward as far as the shed covering a spring near the road, S.W. of the mine. It will be evident W. of the S. Indian Mine. This is indicated by the <sup>low</sup> valley west of the Indian outcrop.

From the Mine to the bank where fence on the north, enclosing the field, the strike changes to more easterly. Strike N 50 E. Magnesian. As indicated by the line of Indian outcrop.



Sheet 2.

25. Half way between the East and West  
north of the slender line and the  
line fence farther north. — Also  
half way between the slender line  
and Buckner's Pond.

But edge of a fine grain. Coarse  
sandstone — sandstone.

stone? and more sandy of the  
coarsely sandy layers in it. Rep-  
resenting the base of the Buckner  
series — the Cambrian.

Strike Magnetic N 55 E. Dip. 70 E.

No right is to be laid on the change  
of dip to the E. It is only loose.

— 0 steps on the E. lies the nearest the  
Crown outcrop.

Half way along the west field on the  
north is more sandstone, superficial  
sandy on the east. The dip is once towards  
the E along the lower part of the hill but  
becomes <sup>almost</sup> vertical at the top. Buckner's  
Pond is N. of the hill. The Buckner is 20 N. E.

Strike Magnetic N 55 E. Dip is not  
vertical in the sandstone layers.



Sheet 2.

26 Opposite (E. of) the southern end of  
Buckner Pond.

On following along the line of  
strike indicated by the last de-  
scribed exposure, I came to an-  
other Cambrian sandstone, which  
I therefore considered an outcrop.

I also took for granted that the  
line of strike remained true up to  
this point. This is further corrobor-  
ated by the fact that an Ar-  
chean outcrop lies only 30 feet  
towards the east. The line of strike  
indicated by this unsatisfactory outcrop.  
Strike Magnetic N45E. Dip E perhaps 75.

This would make a continuation  
of this strike northwards pass on  
the east slope of the little knoll  
towards the north, and would thus  
throw the line of contact on the E.  
side of the knoll, a fact otherwise  
not vouchsafed for.

An  
Organic Fragment of trilobite  
not distinct enough to determine  
the genus was found here but not collected.







ten or more on the top of  
this hill a line of limestone, is  
evidently an outcrop and extending  
along E of the slate. Sandstone  
may well have underlain the  
limestone therefore if at all present.  
Farther north shale occurs in  
the old road bed which  
would also place the limestone just  
mentioned E of the slate. Also  
over the west outcrop which is all  
limestone evidently also lies E of  
the shale.



27 East of the north end of the Buchanan &  
Guel Pond. Along a good earth road  
2.

Walking along a stone wall do-

ing E. over the hill and through

the pasture land.

Plenty of shaly ~~limestone~~ rather sandy

limestone. From this point north-

ward the limestone extends for

some distance but I failed to

make strike and dip.



Sheet 48

27. North end of Backers Bay  
directly E of a Chert outcrop  
in an open grassy field  
Exposure of limestone here, covered  
by a thin distance N. of the contact  
line, but not far. Strike  
Magnetic N40-45 E. Dip, 50 W.  
About 40-45 paces on the E. side  
to see the contact line between  
the Mackinac and the Cambrian  
judging by the topography  
on western side of the hill side. As  
a matter of fact I found a thin  
brown sandstone outcrop in the  
open field towards the north, which  
stratigraphically lies E of the afore-  
mentioned contact line about 60 paces  
to have a  
Strike Magnetic of N47 E and an  
inclination dip, apparently 70 E. to  
have feature again.



Sheet 88

30 S. E. of the bend in the road about  
several hundred yards north of the  
mine, along the base of the hill  
side are numerous thin  
bedded sandstone exposures with  
brown (ferr.) nodules to 10 in.

Strike Magnetic N 65 E dip. 60 W.

From this point northward the

topography indicates that the

cut line between the Ordovician and

the Cambrian lies just west of the

bridge or steep grade crossing the

east side of the hill, and is for a

locality 30



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31 Just east of the bend of the road  
slightly more eastward, going north  
at this point the contact between  
the Dickinson and Cambrian  
is being reached by the strike is N. 30  
and the topography shows the  
the exposure whatever is seen.



Sheet 8

34

just east of the bend of the road <sup>road</sup>  
towards the north, going north.

On a narrow view to the east  
the topography would bring the con-  
tact between the Cambrian and  
the Cambrian just east of the road.  
to exposure whatever was.



Sheet 8

33. Up the hill pretty near the top, N.E. of the last locality is a group of the Archæozoan. Several isolated outcrops may be found about 150 yds farther south but farther down the western slope of the hill. There is plenty of outcrop exposed well along the hill as far as 34. Not a sign of Cambrian was seen here.



Sh. 8.

34.

Point of outcrop at the very base  
of the hill, on the west side,  
had not a sign of *Cornulites*.



Sheet 8.

35. In order to make the Cambrian  
over fall in line with the most  
actual exposure at Locality  
38, it is necessary that the con-  
tinuity line between the Archæozoic  
should pass west of the road  
after leaving Locality 34.  
It is possible therefore that the  
low indication of a ridge just  
west of the road, departing from  
it at a very small angle, is a  
present topographical feature  
representing this contact.  
Exposure whatever.



36. In continuation of the plan  
Sheet copied used for locality 35  
& the contact line between the Co-  
lomon and the Archean rocks  
to the west of the road shown  
here, along an undisturbed  
very poorly indicated surface.  
No exposures whatever.



37 In continuation of the section  
Sheet 8 employed for the last two levels  
the contact line between  
the Cambrian and the Archæozoic  
might be seen here just south  
the beginning of the incline  
along the street, passing west  
from the R. R. depot. No  
further west.



38 On the west side of the road bra, where  
the road begins to rise again. Between  
a house on the west side of the road  
and a little shed on the right side  
is an outcrop, almost concealed  
by the road dirt.

Strike magnetic N 22 to 25 E dip 80 W.

It will be noticed that the strike  
and dip correspond much better  
to a continuation of the contact  
line between the Archean and  
the Cambrian from locality 32  
to a point just west of the Ford  
or mine; then to a bend of the  
contact line along the broad  
road cut or as suggested by the  
published geological map of the  
state.

The exposures here are chiefly bluish  
shale, with a little massive  
limestone on the east, but in doubt  
being blue Cambrian limestone.  
A lot of limestone lies west of this ex-  
posure on the R.R. track. The  
line is therefore east of here.



39 On the north side of a little hill  
St<sup>8</sup> almost directly east of a house on  
a good sized knoll a small hill  
and almost directly east of St.  
here there is Archean formation.  
Now the contact line must  
pass between localities 38 and  
39. And since the creek valley  
just east of 38 would best con-  
tinue the line of strike suggested  
by 35, 36, and 37 the contact is  
located here. The hill range east  
of creek valley for some distance  
north would therefore rest on  
Archean rock, although there  
are no exposures in the course to  
indicate this.

On the north side of  
the hill  
the Archean  
formation is  
exposed



40 Oriskany graptolites west of Oriskany  
Shale, at west end of hill.  
& The contact line must lie quite  
a distance west. No Cambrian  
exposures.



71. Archean gneiss at west end of  
hill. No Cambrian. The con-  
tact line must run about in  
the middle or at the west side of  
the swamp mapped west of here.



42. Archæon quartz at west end  
of hill. The contact line about  
1000 yards nearer the road on  
the west.



- 43 Archaeon grasse follows the road on the east side as far north as the next road on the right leading south to Andover. Referring to the Sedgwick Group, which is indicated by the *Strophomena* *chonetes*, it will be noticed that it follows the contact line very much more towards the west than they do in the region about Andover. And yet this is mainly on the basis of the exposure marked 39. This is only a small exposure, but every thing about it seems to indicate that it is in place. Moreover the strike. Magnesian for 38 is  $N 22-25^{\circ} E$  and the local strike for this ought to be about  $N 14-17^{\circ} E$ . And it is surprising, after a line run in this direction is drawn east of 38 through the creek bed, how near the localities 32, 35, 36, 37 fall in line with this strike. And how only a slight easting south of 38 would make it pass just west of 43. (over)



58  
I suppose this section does not ac-  
tually take place ~~between~~ un-  
til the point is reached, west of  
90, where three creeks or four, all  
meet, to form one. An section  
made at this point, to a point  
just west of the most northern  
underground mine would meet  
the facts as at present understood  
very closely.



Sheet 8.

44 From the forks in the road south -  
ward to this locality the contact  
must have been west of the road, where  
the Michewan borders the road on the  
west as far as Cambrian is  
seen.



45 At this end of the road is plenty of  
Archaeon gneiss but no Cambrian.  
The contact must run  
west of the road.

Sheet 8



46 There is plenty of Archæum ~~gemma~~ ~~rose~~  
along the road here, on the east side  
of the road.

Sept. 8.



47 From the last locality to this, the  
*Archaeosyrinx* forms good outcrops,  
keeping about parallel with the road,  
on its east side, slightly diverging  
from the course at 47.

Sheet 8.



48 Plenty of a calcareous wavy much  
broken shale, with sandy layers  
below. ~~SESE~~

Strike Magnetic N 23 E Dip 40 N  
The Contact between the Archean  
and the Cambrian rocks therefore  
between 72 and 78.

Sheet 8.



49 A somewhat slaty shale.

Strike Magnetic N33E dip 40 W.

According to this the contact is

turning more easterly here.

Sheet 8



50. This bend in the road is north of the  
exposure. The bend is located too  
far east on the map. It should be  
quite close to the railroad, and  
about N.N.E from 49.

Strike Magnetic N 40 E. dip 40 W.

This indicates that the strike is be-  
coming still more easterly, so as  
to meet the exposure east of Cliff Road.

The rock is limestone underlain by  
a sort of crumbling shale.



51 Contact between Archaean and  
Clenellus Cambrian Sandstone  
on south side of the road leading  
past the south end of Sliff's Pond,  
and about 150 yds east of the forks  
of the road.

Strike Magnetic N 53 E dip 33 W.

Sandstone at the contact. The crum-  
bly calcareous shale farther west, and  
still farther west are limestone beds.

Fossils. Clenellus Thompsoni.

It is evident that unless some un-  
expected bends take place, the con-  
tact line between the Archaean and  
the Cambrian must run about as  
indicated by the red pencil mark  
from locality 50 to locality 51. At  
any rate it can hardly run very far  
up the hill side judging from the  
strikes at 50 and 51. Since this is  
hardly likely to be debatable ground  
and since it has no doubt been  
mapped by Mr. Tarr, I did not  
take the trouble to examine it.



52 On the left side of the bench is a  
chain with Cambrian strata  
towards the left. It strikes N 35 E.  
dip 40 W. From this point along  
the road northwards are plenty  
of Archæan exposures but the  
Contact line must run con-  
siderably to the West.



Sheet 8

53 NW 1/4 sec. of T<sub>1</sub> Rd  
/

Strike Magnetic N 50 E, dip 50 N



51

109



Sheet 21

55 Plenty of Archæan exposures here  
but the contact line is not as  
great west of Bluff and Howell's Ferry.  
From this point northward are plenty  
of Archæan exposures along the  
east side of the road. No Con-  
drian was noticed although a  
search was not made.



56 Contact line west of the road. The  
sheet 11 Cambrian limestone appears on  
the west side of the hill, and - across  
the steep slope of the foot of the main  
hill. Andean granite occurs  
further north towards the west of  
main. Cambrian limestone is on  
the road on the east, and some  
granite outcrops on the hill. The  
strike is about that of 57. N. of  
E. West.

~~Andean~~ can determine not  
Cambrian



57 Contact on the west side of the road  
bed. Cambrian sandstone under  
the rail fence and also farther  
sk. 21 westward with a limestone layer  
between. Oriskany limestone  
on the east side of the road in  
strike Magnetic N. 50° E. Dip 25°  
Fossiliferous limestone.  
It will be noticed that the  
beds dip of 50° N. and 25° N. and  
along the contact line west of road  
on Oriskany beds.



58. Contact line west of mill. on west  
side of road. East of road is Quartz  
concretion. West of road is Archaeo-  
zoic towards S. E. side  
exposed. Archaeo granite  
to the S. W. side West. The Concretion  
and concretion is  
further West.

Strike Magnetic N. 5. E. 3. of 100.  
It will be seen that the concretion  
is west of the contact line west  
of 58. the most north Archaeo-  
zoic outcrop.



59 Archæan limestone. south east  
Sh<sup>21</sup> of the name are Archæan gneiss  
outcrops. Possibly the identifica-  
tion in the topography towards  
the coast of a line connecting  
59 and 60 was formerly to a  
greater or less extent limestone  
which has since been worn  
away. In proof of this observation  
I went to that north of the so-called  
Blue state line east of Tuscarora  
hills I saw plenty of limestone  
extending northward along  
the whole way from the  
up into the identification. The last  
letter is looked up as a  
being accepted as true.



60 Plenty of exposures of Archæan series  
on West side of the road in a good  
sized long ridge. No Cambrian  
seen <sup>in situ</sup>, although fragments  
supposed to be of Cambrian origin  
were rather frequent in some  
places in the soil. Hence north-  
wards the outcrops are as indi-  
cated on the map, all being  
Archæan.

Sheet-21.



Sept 21

61 Archaean exposures. No Cambrian. The exposures as far as 62 are delineated on the map.



62 Archaean gneisses. Exposed with  
sh.<sup>21</sup> bands not marked down but ex-  
tending from 10 at frequent in-  
tervals to 9. No Cambrian being  
exposed the entire length.



63 From 61 to 63 no exposures were  
Sh. 2<sup>1</sup> found although the contact  
line probably lies constantly some  
hundred yards east of the rail  
road end of Sams Pond. Out-  
crop 63 is a very good exposure of red  
quartzes. No Cambrian. Its posi-  
tion on the map is not very exact-  
ly located although it will be easily  
found with the map as a pos-  
itive guide. There are no outcrops  
between 63 and 64.



64  
Sh. 21 Archaeon gneiss Outcrops are  
fragmentary from this point as far  
north as the rail road. No Cambrian  
or other rock was anywhere  
found in contact with the ~~gneiss~~.  
In my opinion the line from  
64 north east is a fault line.  
The Cambrian of 8 extends south-  
wards perhaps until some place  
near 61 but in deference to ~~Mass.~~  
Reports I mark it as indicated  
by the blue pencil lines.

(cf. R. S. Tan Note Book 19 New Jersey  
p. 49.



65- Archæan gneisses, with contacts  
at base of hill probably repre-  
senting contact line with  
Cambrian, see next locality.



66. Richman in the hill side on the  
sh. 21 East. A valley below <sup>Cambridge</sup> ~~Richman~~ <sup>at</sup> ~~the~~  
with sandstone layer on the west  
on the west side of this valley.  
Strike Magnetic N 23 E. Dip 45 W.  
It is evident that the strike error  
becomes more easterly going north  
as the exposures of the Richman  
would suggest. These exposures  
continue northwesterly to  
Richman as the red line suggests.  
Strike and Dip from Millstone.



67 Archean gneisses. Contact line  
between Archean and Cambrian  
on the west. Fault line along  
the brook and swampy meadow  
between the two hills.

Section  
21



68 Plenty of exposures here of limestone. Some of these exposures <sup>very</sup> well exp. the hill. All having a general NE strike and a west <sup>end</sup> dip. I think they continue to dip in this direction up to the foot of the next hill where the fault brings up the Archæozoic again.

Shul  
32



69 Sheet 50.

69 North side of Hamling in the  
R.R. cut. A large rock with  
columns rounded on the west  
side, and a large square for  
24 feet square. The top of the  
column.

Strip showing #302. D. 30 ft.  
from top. The top of the  
rock, not much of the  
rock, only for 100 ft.



70 About where the summit of the mountain is in the center of the range there is a quantity of the limestone of the <sup>east</sup> side, the same of which we saw to some extent at the west of the Washington and Kentucky road some miles from a large limestone quarry. It is in places about a second size, with some of the smaller ones. There is also a large quantity of the limestone of the east side. It is here in a few places about 67 feet, perhaps, in 70 feet or more. The layers are about 40 to 50 feet thick. The eastern part of the hill for some 60 feet is covered with a layer of the same limestone. I did not see any other limestone further north.



71 From 69 to 71 the Archæon  
groups form steep declivities  
although the dip of the same  
is SE as usual. A fault is  
assumed to have along this  
line, separating the Archæon  
and the same from the limestone  
stone with the same cor-  
respondence to the fault be-  
tween 64 and 67 farther south.  
In fact, the exposures south  
of 69 were examined I think  
by the same person that the  
fault was wrongly called  
in 1861.



72 Cambrian limestone, almost a  
sandstone. Its base not shown  
here. From here to 76 these im-  
brian rocks have approximately  
by the same strike and dip  
and the exposures follow each  
other along the strike.

Sheet  
30



Sept 30

73 The Archæon is shown below  
the Cambrian contact which  
is abundant.



74. Plenty of Archaean rock, <sup>about</sup>  
shut by gneiss.  
50



75 More Cambrian sandstone,  
shel<sup>er</sup> with shaly members on top  
30 ft. The contact with the  
charcoal lies in the valley toward  
the west.



76 From 72, above 73, along 75 to  
St<sup>100</sup> 76 are the Cambrian sand-  
stones in range. These could  
be followed further out there  
was no time. It is to be noted  
that the Cambrian sand-  
stones are becoming thicker  
towards the north, and some  
quite important clay con-  
glomerates are becoming  
intercalated with the sandstones.  
The lower Cambrian are  
becoming more pure sand-  
stones, a fact already re-  
garded by Professor from 52 & 53.



72. From 73, through 74, to 77  
St. 50 are Archaean exposure which  
could be followed further north-  
wards. A valley lies just west  
of the course, representing the  
contact between the Archaean  
and the Cambrian strata in  
this west. At 72 the Archaean  
is lower than



78 From 72 at foot of the hill and  
eastward is believed to extend  
Sh. 20 another fault line. Its course  
was not traced at all. Judg-  
ing from its own description  
it should run across the top  
of hill 622 just east of the top.



Sketch No.

of. Mason. Ed. Jan. 17. 1890 p. 40 & 41

79. Not located on any map is the  
of the hill 622, just east  
of the lake. The contact be-  
tween the Archean and the  
Cambrian limestones runs  
across the top of the hill in a N.E.  
direction. The Cambrian sand-  
stone here seems to be a fault.  
It is ~~not~~ rather a very coarse  
stone, with the lime ~~not~~ rather  
out, and iron infiltrated.  
At top of the hill I thought the  
so called sandstone might  
be a fine grained quartzite  
rock or coarse grained quartzite.  
The contact between Cambrian  
and Archean is brecciated  
as it should be, along the con-  
tact line on top of the hill  
which is a fault. The actual  
unbrecciated contact line  
in the valley towards the west  
is not exposed.



80 Not located on the map is quite a distance N. E. of Mc Afee, and N. E. of aforesaid hill 622, on the E side of the road. pretty well up, among a clump of trees surrounded by open fields. One strike from here was partly taken from actual exposures, partly from a bearing on hill 622, east side.

Strike magnetic N 65 E dip 20° W. Mostly sandstone and plenty of it. It will be noticed that this line of strike when corrected for the variation would run <sup>not faulted</sup> the contact line along the valley west of hill 622 to a point west of the Simpson Mine ~~hill~~ sandstone exposures, and then to the sandstone exposures of Sections VII, VIII, IX. (Nason's Map N. J. Report 1890)



81 South of Simpson's Mine South  
of Mc Lee. Here towards up-  
per part of hill, in the south  
west side of the woods are Com-  
brian slaty shale exposures  
not exactly typical Cambrian  
but yet known to replace the  
Cambrian basal conditions  
more or less in many places  
strike Magnetic, N 25 E, D 45 W.  
At top of hill towards the S. E.  
is a regular quartzite, which  
together with similar rocks at  
22, and 83 I am inclined to  
consider "sandstone dykes" and  
not true Cambrian sedimentary  
There are no exposures of Archæan  
limestone between these expo-  
sures and the R.R. as indi-  
cated on the map.

Sheet  
30



82 Half way between Mc Afee  
and Hardistonville.

Sheet  
30 Plutonic mass of the Slaty shale  
replacing the Cambrian sand-  
stone. The Archean lies west  
of the same.

Strike Magnet N 40 E Dip 40 S.  
Quite a long exposure.



cf. Harvard Univ. Dep. 1890 k 43-44. J. C. Hoff-Notes July 22 1891. 1461 189-88.  
Sheet 32

83

Andersen limestone on the East. A "concretion dyke" cutting the course along the east side of the brook in a direction almost strictly parallel with the brook: N 80 E.

The strike of the true Cambrian however is strike Magnetic N 30 E D. of 25 N. In my estimation the quartzite of the concretion dyke and the Cambrian concretion proper are totally distinct things. Fossils. *Scolites linearis*. Very common. *Clonella Thompsoni*.

I recall again the quartzite it is as probably a "concretion dyke" I hate to believe in the Cambrian sedimentary origin.



84. The sandstone at this place is  
shell probably the Cambrian sand-  
stone, but I do not know  
certainly. If it is Cambrian  
then some Cambrian slates have  
been changed to a very fine  
grained almost adinole rock.  
The sandstone is evidently  
folded three or four times in  
the short exposures and is cut  
off transversely to the strike  
of the folds by the Archæon  
limestone on the north, while  
the Archæon on the south  
may have been originally be-  
neath the sandstone. The pre-  
sence of fluorine here suggests  
the opening of fissures here, and  
the probability is that the sand-  
stone is faulted in here. Van  
der's report of the sandstone  
dipping under the Archæon  
limestone I do not believe  
looks in that way at all.

Ch. Cambrian. Rep 1890 p. 45 & 46 Sec. XIV



little point, but the general view  
across here is that of a cut off  
by a fault on the north at least.



Roseville locality  
Scolithes bismarck  
Scolithes ~~tr~~

Sheet No. 8. 100-200 yards S.W. of Wright's pond.

Sockwood locality  
Scolithes

Sheet No. 2.







